**Template | Unit Enhancement**

***EXPLANATION & ARGUMENTATION***

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**Background Information**

**Instructional Materials Title: Circuits and Pathways**

**Publication Date: August 23, 2013**

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**Date Developed: August 23, 2013**

**High Leverage Lesson (Title and Page Number): Lesson 5: Conductors and Nonconductors, p.35**

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**Rationale**

We identified this lesson because understanding the difference between conductors and nonconductors is an essential concept to the unit. It is a component of understanding how a complete circuit works and how electricity flows through it.

It connects to Practice 6: Constructing Explanations and Explaining Solutions

NGSS 4-PS 3-1, 2, 3, 4

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***Explanation* Lesson Enhancement**

**Overview**

· **Identification of where within the High Leverage Lesson to insert enhancement**

· **Key instructional strategies and tools needed**

**Part 1: Lesson Modifications to Lead Up to *Explanation* Experience**

No modifications were made to any lessons prior to lesson 5. The only modification made to Lesson 5 was a slight change to the Focus Question, “What type of materials are conductors?”

**Part 2: *Explanation* Learning Sequence**

1. Define the CER and introduce it through something relatable to students, ex: \_\_\_\_\_\_\_\_\_\_\_\_\_is the best singer, basketball player, etc. (Like the video we watched in training.)
2. Show the Audi commercial: Claim--My dad is a space alien. Have the graphic organizer (for teacher use) we used at training for students to identify the claim, evidence, and reasoning the girl in commercial gives. Complete GO as a whole class. Provide the rationale—students need to be able to persuade others that their claims are justified.
3. Use an article/data table and have students identify the claim, evidence, and reasoning with a partner or small group. Use a graphic organizer frame for them to complete (same as step 2).
4. Use Lesson 3 to write a shared CER for what is needed to make a bulb light up.

5. If needed, have students complete another similar activity but independently, prior to Lesson 5.

**Part 3-A: Describe Assessment Task**

*Include the* ***question****,* ***evidence*** *students will use, and* ***scientific concepts*** *students will use in their reasoning.*

Question: What type of materials are conductors?

Claim:

L3: Objects made of metal are conductors. OR Metal is a conductor.

L2: Pennies and foil (naming 2 of 3 objects) are conductors.

L1: Some things are conductors. OR A penny. (naming an object either correct or incorrectly).

Evidence:

L4: List all 3 objects (penny, foil, screw) as conducting electricity (lighting the bulb) and some objects as non-conductors.

L3: List all 3 objects as conducting electricity (lighting the bulb).

L2: List 2 objects as conducting electricity (lighting the bulb).

L1: One or no objects correctly listed as conducting electricity (lighting the bulb).

Reasoning:

L4: When I tested the (name a metal object)... OR When I tested the metal objects…

…the bulb lit, forming a circuit, allowing current to flow through. Therefore metal is a conductor.

L3: When I tested the (name a metal object)… OR When I tested the metal objects…

…the bulb lit. Therefore metal is a conductor.

OR

When I tested the (name a non-metal object)… OR When I tested the non-metal objects…

…the bulb didn’t light. Therefore non-metal objects are not conductors. (This starts to get at Rebuttal)

If both elements of L3 are present, then it is L4.

L2: Pennies and foil (any two metal objects named) are metal so they are conductors. (Repeating the claim)

L1: No reasoning present or doesn’t make sense.

**Part 3-B: Assessment Rubric**

See above for Rubric levels

Variation 2: To be used for first quarter of 4th grade Variation 3: To be used later in the year 4th

Grade or with 5th grade students

1. Claim 1. Claim

2. Evidence-multiple pieces 2. Evidence-multiple pieces

3. Reasoning

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**Additional Information**

NOTES

· Information that will be useful when teaching this lesson

- Resources that will be useful

- Scaffolds that students will use

Utilize the PSEPonline wiki to access video.

Create a CER graphic organizer (refer to Aug 19, 2013 Participant Notebook packet p. 7 and p. 20.)

Identify a high interest non-fiction article that has CER framework evident. Ex. Scholastic News, Time for Kids, etc.